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Michigan Business Review

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Announcement . . .

Joseph M. Dodge, First University of Michigan School of Business Administration Business Leadership Award Medalist and Lecturer

An annual Business Leadership Award Medal and Lecture is being inaugurated by the University of Michigan School of Business Administration. The first business leader to receive the Award and give the lecture is Joseph M. Dodge, Chairman of The Detroit Bank and Trust Company. The subject of Mr. Dodge's address is "The Business of Management." His lecture will be printed in the next issue of the "Michigan Business Review."

The idea of the award and lecture originated with the Student Council of the Business School. The members of the Council said they would like "to set up an annual award which would become one of the finest honors a man of the business world might receive." The Council offered to provide funds to finance the presentation of a medal each year to a "businessman of accomplishment who has shown an understanding of the responsibility of business to society and an interest in business education."

The Council felt that a lecture by such a man would contribute greatly to the education of the students and alumni of the School. With the cooperation of the Dean of the School and the Student Council, a committee of representative students and faculty members has been organized to administer the annual event.

The medal, two inches in diameter and hung from a maize and blue neck ribbon, will show on one face the tower of the Business School building, on the steps of which is a businessman shaking hands with a student. Around the edge in raised letters is "The School of Business Administration, University of Michigan." On the opposite face is a palm design symbolizing success, and the words "Business Leadership Award For Distinguished Service In Business." Following this, the name of the recipient and the date.

Mr. Dodge, because of his exceptionally meritorious service to the government and his business achievement, was selected as the first to receive the award by a committee of senior faculty members and Student Council representatives of the Business School.

He has been a contributor to the "Michigan Business Review," and has been a speaker on various conference programs of the School. He was a member of the Executive Committee and Treasurer of the University's Phoenix Memorial Project, which raised $7,500,000 for peacetime atomic research.

Upon graduation from Detroit's Central High School in 1908, Mr. Dodge began his business career as a clerk with Standard Accident Insurance Company, Detroit. A year later he was a bank messenger. At twenty, he became Michigan's youngest state bank examiner.

Six years later, as a bank officer, he gave a series of weekly lectures for the American Institute of Banking on Elementary Banking.

From 1917 to 1932 he was Vice President and General Manager of a large automobile agency. He then returned to banking as Vice President of the First National Bank, Detroit, followed by the Vice Presidency of the National Bank of Detroit. In 1933, he was elected President, Director, and Chairman of The Detroit Bank. He held these positions until 1953. Since 1954, he has been Director and Chairman of The Detroit Bank which, in 1956, as a result of a series of bank mergers, became The Detroit Bank and Trust Company.

Mr. Dodge is a past president of the Michigan Bankers Association, the American Bankers Association, and the Association of Reserve City Bankers. He is a member of the Boards of Directors of the Chrysler Corporation and the Holly Carburetor Company, a trustee of Harper Hospital, as well as many important Detroit civic organizations.

Mr. Dodge has a brilliant record of national and international public service in the Roosevelt, Truman, and Eisenhower administrations. He won the respect of our own country and of foreign nations for his handling of their budgetary problems. For this service he was decorated in 1946 by President Truman, receiving the Medal for Merit.

He was Financial Adviser and Deputy for Trade and Finance to General Eisenhower, European Theatre, 1945–46. Mr. Dodge was next appointed United States Minister representing the United States on the Austrian Treaty Commission, Vienna; and Deputy to Secretary of State Marshall, for Austrian Affairs at the Foreign Ministers Meeting, London, 1947; United States Minister and Financial Adviser to General MacArthur, Japan, 1949–52; and Consultant to the Secretary of State on Financial and Economic Problems relating to Japan, 1952–53. In 1951 Mr. Dodge was decorated for Exceptional Civilian Service by the Secretary of the Army.

After serving President-elect Eisenhower in 1952 as a special representative in Washington, Mr. Dodge became Director of the Bureau of the Budget, 1953–54, and was the first Budget Director to sit with all meetings of the Cabinet and the National Security Council. From 1954 to 1956, he was Special Assistant to the President of the United States, and Chairman of the Council on Foreign Economic Policy.

Mr. Dodge has received honorary degrees from Wayne State University, the University of Michigan, and Olivet College.

• *History, membership, operations, activities, and policies, as . . .*

The NAM Looks Ahead

Milton C. Lightner

IN times of trouble, Americans have always shown a strong instinct to close ranks when called on to solve problems that weigh heavily upon the nation. In 1894, when a great financial panic had disrupted business and disheartened the nation's people, a Southern newspaper, *The Dixie Manufacturer,* invoked this traditional instinct. It called on businessmen to get together and do something about the nation-wide slump.

In response, nearly 600 manufacturers gathered in Cincinnati in January of 1895 at the organizational meeting of what was to become the National Association of Manufacturers. Shaking off the discouragement of the then current economic depression, the conferees looked ahead to make plans for a better American future firmly rooted in the ideals of hard work, fair competition and individual freedom.

Their determination was expressed in Article II, Section I (which has remained unchanged for 62 years) of the Association's Constitution which asserts:

"The general objects and purposes for which the said corporation is formed are the promotion of the industrial interests of the United States, the fostering of the domestic and foreign commerce of the United States, the betterment of the relations between employer and employee, the protection of the individual liberty and rights of the employer and employee, the dissemination of information among the public with respect to the principles of individual liberty and ownership of property, the support of legislation in furtherance of those principles, and opposition to legislation in derogation thereof."

Campaigns and Achievements

Since that meeting in Cincinnati, the Association has been foresightedly making America's business its business. It was one of the first groups to campaign for the establishment of the U.S. Department of Commerce, and the files of NAM's offices abroad and in Latin America were contributed to facilitate creation of the Bureau of Foreign and Domestic Commerce. NAM's interest in promoting international trade has persisted over the years. It has sponsored two international conferences of business and participated in a third for the purpose of promoting international commerce generally, and particularly that of the United States. It helped promote the Panama Canal. It caused the formation of the National Industrial Conference Board in 1916. The NAM supported the first laws regulating interstate commerce for the public protection, and it fostered early accident prevention programs. The NAM championed the passage of workmen's compensation laws two years before the American Federation of Labor became active in this field.

Scores of other such drives and achievements have marked the NAM's history of looking ahead, up through the Association's

About the Author—

A graduate of this University (A.B., 1910; LL.D., 1954) and of the Harvard Law School, Mr. Lightner is Chairman of the Board of The Singer Manufacturing Company, and is currently President of the National Association of Manufacturers.

post-World War II pledge of employment for three million veterans—which pledge it greatly surpassed—and its present efforts to encourage useful employment of handicapped and older people.

Members—Large and Small

Meanwhile, the Association has won increasing support and has grown into an organization of nearly 22,000 U.S. companies, including most of the leading manufacturers in the country. Its membership produces 85 per cent of the nation's manufactured goods. NAM is a voice of American industry but, contrary to some well-propagandized assertions, it is not merely the voice of "Big Business." Eighty-three per cent of the NAM's members are what our Government defines as "small business," as they employ fewer than 500 persons each. A fourth of the Association's members employ less than 50 men and women each.

As its name implies, active membership in the Association is limited to manufacturing enterprises. However, non-manufacturing companies whose activities are directly related to manufacturing can become Associate or Cooperating Members. At the moment, some 4,000 such firms are allied with NAM.

How Policies Are Formulated

NAM policies are not concocted in smoke-filled rooms by a cabal of industrial giants. At present, nearly 3,000 representatives of NAM member companies participate actively in the work of the policy-making and advisory committees.

There are 11 of these policy committees, ranging in their assignments from taxation to conservation of renewable natural resources. In addition, six advisory committees assist the Association's president and Executive Committee in the fields of government relations, economic policy, education, relations with other associations, national development, and public relations. The NAM's 180-member Board of Directors, like its committees, is made up of industrial leaders from companies of all sizes, in all industrial fields, and from all parts of the country.

NAM policies originate in the policy committees. After weeks, months or even years of study, a committee's recommendation is submitted to the Board of Directors for its consideration and action. The Board may adopt the recommendations as NAM's policy or position, or it may modify the proposal, or it may recommit it to the committee for further study, or it may reject it entirely. If the Board's action is to adopt a policy, such action requires a two-thirds vote.

As a result, NAM's policies or positions represent a thoughtful distillation of the convictions of a very broad coverage of industrial managers acting in the public interest.

The Association has a professional staff of some 400 people. About half of these are located in the Association's New York national headquarters and in the NAM's Washington office. The rest are spotted across the country in five divisional and 13 regional offices from Boston to Los Angeles.

Industrial Relations Division

One of NAM's more important and increasingly effective activities is its Industrial Relations Division. This department is constantly concerned with the first of the forward-looking objectives set by the Association founders; namely, "betterment of the relations between employee and employer." Under the immediate direction of the Division, the Association for years has conducted annual Industrial Relations Institutes in which hundreds of top management executives gather to discuss current employer-employee problems and exchange "case history" experiences.

Recently, the Association launched a nationwide series of clinics to explore more particularly the problems of the salaried employee. The Industrial Relations Division is always on the alert for new, tested techniques in the field of employer-employee relationships and it brings these developments to the attention of management through a continuing flow of pamphlets, booklets and the like.

Labor Policies

Another of the Association's objectives is "the protection of the individual liberty and rights of the employer and employee."

NAM has historically been in favor of free market principles and opposed to monopoly, whether in business, government, or labor. Its belief in the right of free choice for the individual has led the Association—in the public interest as well as that of employees and managers—to fight the closed shop, compulsory unionism, and other monopolistic labor union practices.

The NAM's official policy says that, "In a free society there is need to afford employees at all levels the fullest degree of individual freedom and opportunity consistent with the coordination required for efficient operation." It further advocates that, "Every employee and prospective employee should be guaranteed freedom, without intimidation or coercion from any source, to join or not join a labor organization and to maintain or discontinue his membership and participation in its activities."

Attitudes Toward Union Power

The Association believes that if these principles had been followed by America's labor movement, the abuses of union power revealed by the McClellan hearings could never have occurred. The leaders of certain nation-wide labor unions were permitted to wield unchecked power. Power without restraint inevitably corrupts, and this corruption is a threat not only to American justice but to our free economy, to honest unions, to the right of union members and of the public, and to the nation's political institutions.

The Association is convinced that abuses in the labor movement cannot be corrected by superficial measures designed principally to make union leaders honest. Correction can come only by controlling monopolistic power and by eliminating the fundamental means whereby autocratic power can be seized and held by an individual or a small clique. The law already — and rightfully — prohibits the acquisition of uncontrolled monopoly power to all elements of American life except the labor unions.

Dissemination of Information

The NAM Constitution calls for "the dissemination of information among the public with respect to the principles of individual liberty and ownership of property."

Out of the New York headquarters, the Association's Public Relations Division directs a steady flow of pamphlets, booklets, brochures, magazine articles and press releases designed to broaden the general public's understanding of the nation's economic problems and of industrial management's policies. In public service time on both radio and television, NAM presents weekly programs to dramatize and clarify these problems and policies. It has been said that NAM uses every method of reaching the public but carrier pigeons and that if the pigeons ever prove practicable, NAM will use them too.

A very important activity in "the dissemination of information" is the work of NAM's Education Department. The aim of this department is to help education meet its problems and to cooperate with educators at all levels to improve knowledge and understanding of the nation's economic system.

Looking ahead toward America's continuing needs for scientists, business people and better citizens, the Education Department cooperates with teachers to bring economic and practical business information into the classroom by making available filmstrips, speakers, demonstrations and other programs to teach living business and the business of living to school-age Americans. On request from teachers, and local education authorities, it distributes as many as three millions of classroom booklets a year, mostly for high school use. All are prepared under the supervision, and bear the seal of approval, of the Educational Aids Advisory Committee, composed of 18 distinguished and impartial scholastic authorities.

The Education Department also promotes corporate support of education through direct

contributions and the provision of scholarships.

National Economic Policy

In the field of national economic policy, the Association directs its efforts toward "the support of legislation in furtherance of (its) principles, and opposition to legislation in derogation thereof"—as enjoined in the NAM Constitution.

To carry out this objective the Association maintains a Government Relations Division in Washington, which serves as an avenue of communication between industry and the Federal government. Staff personnel maintain contact with the Congress and with Federal departments and agencies to provide them with industry's views on national and international problems, and to report back to the NAM and its membership on governmental and legislative developments. Members are kept informed of these developments mainly through *The NAM News*, the Association's weekly newspaper.

NAM seeks to present its views to all America. It believes that an informed public will support sound solutions to national problems. But eventually basic decisions on matters affecting national policy come before the Congress in the form of proposed legislation. At that time, pursuant to its duty to support legislation in furtherance of its principles, representatives of the NAM appear before Congressional committees and publicly state the Association's position, which is always governed by and in accord with the basic policies already established by the Association.

Position in Taxation

These in turn stem from NAM's belief in free market principles, fair competition, and the preservation of individual freedom and incentives. The Association's position on taxation is a typical example. Agreeing with Chief Justice Marshall's historic warning that "the power to tax involves the power to destroy," the NAM's policy principles on the subject of taxation hold that:

1. The taxing power should be used only to finance the proper functions of government and not to achieve social reform.
2. The Federal tax system should be broadly based.
3. Taxation should not undermine incentives nor impede economic progress.
4. Tax rates should be fair and equitable, and moderate at all levels.
5. Constitutional limitations should be imposed on the Federal power to tax incomes, estates, and gifts.

Inherent in the above principles is the belief that the nation can and should raise the tax revenues it requires without unduly burdening or disrupting the operations of our free economic system. Tax rates which rise too rapidly with rising earnings, and which soon begin to take more of each additional dollar from the income receiver than he is allowed to keep himself, undermine and weaken the incentives we depend upon to spark economic activity. Also, such excessive rates drain off capital badly needed for investment in new ventures.

The truth is that these heavily progressive rates are self-defeating. They do not so much "soak the rich" as prevent anyone from becoming rich. They penalize and discourage the citizen who is trying to advance or the small business seeking to grow.

Such discriminatory taxation frustrates the creative efforts of those who have the most to contribute to our progress. It discourages the kind of imagination, initiative, venturesome spirit and unstinting work that has built America and which must continue if we are to endure.

New Times, New Stands

The NAM has taken firm stands on many issues, such as the above, which affect our national economic life. We will continue to do so in the future.

Nuclear power, and the ways of applying it in peace and in war, are bringing an era of vast and rapid changes in the conditions under which we must continue to live. But it is the fundamental belief of the NAM that, no matter how novel the developments which

improve our living or hasten our dying may become, the great changes which are occurring in our industrial life can and should be carried out without sacrificing human liberty and individual opportunity.

Throughout our history, the American idea has given our people greater abundance and more social progress than has been enjoyed by the people of any other nation. But sound ideas, like sound buildings, can crumble and fall unless people continuously work to preserve them. In the occasional clamor for expedient compromises with America's economic liberties, the NAM has often found itself on what seems to be the less popular side. But, committed as it is to the preservation in this country of a free, individual competitive enterprise system and of individual liberty, NAM naturally must be against proposals which would tear down or whittle away those basic American fundamentals. But in being against the things which would weaken the American idea, we have been for the things which would strengthen it. NAM is dedicated to constant efforts to preserve for present and future Americans the principles of fair play and individual freedom which are the foundation of our country's economic life.

That has been the history of the Association in the past; and that will be its history in the future. NAM will continue to pursue the sound policies and objectives which were set forth by its founders at a time when American industry was just beginning to put fear of the future aside and realize its enormous capacity to build a better America for all, and which are equally valid—and perhaps even more needful—in the world of today and tomorrow.

BUSINESS BOOKS; 1957

Business Books; 1957, **the annual review of some of the outstanding business books of the year, has just been released by the Business and Technology Department of the Cleveland Public Library. It is Vol. 28, No. 4, of the quarterly bulletin, *Business and Technology Sources.***

These books reflect progress and potentialities, as well as effective practices and techniques in the business field, under such topics as: The Future Years; Accounting and Control; Advertising and Marketing; Motivation Research; Agribusiness; Communication in Business and Industry; Executives, Their Selection and Development; How They Handle Their Personnel; The Investment Field; The Office in Transition; Operations Research; Statistical Methods; and Factory Management.

Single copies are available free at the Library, or for a mailing and handling charge of 25c each. Address the Order Division, Cleveland Public Library, Cleveland 14, Ohio.

• *Examples from the Interstate Commerce Commission, the oil import limitation program, and the Atomic Energy Commission.*

Hidden Regulation

Samuel Insull

"HIDDEN Regulation" has been taken, failing a more apt one, as the title for a discussion of the extension of Federal regulation of United States business, not into new fields of business—for such extension is well known and generally regarded as inevitable—but rather into new areas within existing fields. Almost certainly the public, and possibly even the student, is hardly aware of the degree of such intrafield extensions and in at least one case there is question whether the Regulator himself is so aware.

The objective in this discussion is purely that of exposition. Evaluation of the facts is attempted only to the extent necessary to define the questions raised by their existence. Nor is there any attempt to define ultimate effects.

The attitude then is solely to direct attention to these phenomena as possibly worthy of interest, perhaps even of study. Programs are announced neither for their promotion nor their suppression.

If the matters herein under discussion are worthy of any further consideration at all, additional research is the first requirement. On the other hand, except in connection with the third phenomena discussed—which being in the nuclear field is necessarily shrouded in official secrecy—the attempt has been to make no statements which are not either documented or documentable.

About the Author–

A graduate of Yale's Sheffield Scientific School, Mr. Insull has been with utility companies, in manufacturing, and served in the United States Navy during World War II. Since 1951 he has operated his own insurance agency in Chicago. This paper is adapted from one presented by him at the Midwest Business History Conference, in Madison, Wisconsin, on February 15, 1958.

Summary

To make somewhat clearer the comments in the body of the discussion below, it seems reasonable to summarize the discussion at the outset rather than at the conclusion.

There are presented three progressive instances where regulation by Federal Governmental Agencies, well established in a given field, has proceeded into an area of this obvious field in which its existence is not initially apparent and may not be suspected, as follows:

First—Railroad Freight Rates. In regulating railroad freight rates on movements competing with other forms of carrier the Interstate Commerce Commission, in addition to applying expected techniques of assuring that rates are neither (a) excessive in relation to railroad costs nor (b) so low as to be discriminatory, not infrequently bases the railroad rate to a large degree on considerations of the effect on the relative flow of traffic as between railroads, waterways, and trucks. In such cases, the Commission starting out to regulate railroad freight rates may end by controlling or influencing how the shipper will route his freight. In such instances the Commission proceeds consciously.

Second—Government's Voluntary Oil Import Limitation Program, Pacific Coast. Although this program is named "voluntary," in effect it is a Governmentally controlled program policed by the threat of more stringent mandatory control. If the Government

proceeds with its announced program in respect to the importation of Canadian oil into the Pacific Coast (and particularly the Puget Sound) area, the whole liquid petroleum transportation and production structure north of the border to the Arctic Circle will be radically reoriented to channel the output to Eastern Canada, thus making it unavailable to the American areas mentioned. Immediately the effect may be as if an administrator serving in the United States Department of the Interior were to order and enforce the expenditure of several hundred million dollars on petroleum transportation facilities between Alberta and Montreal—in addition to those already projected. It is doubted whether the Administrator or the Department realized when the program was first offered that this might well be an effect.

Third—Atomic Energy Commission. Rental Valuation of Enriched Uranium. From nine to ten per cent of the total electric power production of the United States is currently being consumed in the process (gaseous diffusion) of producing refined uranium for use as a nuclear fuel and possibly for other uses. This and other figures raise a strong presumption that the value established by the AEC for rental of this fuel is substantially below its economic cost, exclusive of any considerations of commercial versus Government accounting. Discussion below justifies, it is hoped, the inclusion of this subject under the heading of "Regulation"; in a word, the only difference is that here the Regulator and the Regulated are the one and the same governmental Commission. If and to the exent that the valuation of nuclear fuel is radically below its economic cost, the whole basic economics of nuclear power generation is tilted, if not upended. Whether the Commission itself, operating on what accounting system we know not, realizes the existence of this situation—if it obtains—we cannot know. The subject is included here because the writer believes that the reader will be surprised to realize that even when the cost of nuclear power in the United States has become apparently "competitive" with the cost of power produced from other energy sources, the existence of the foregoing situation, if it does actually obtain, may mean that the apparent equality may prove to be not only wholly, but grossly, illusory.

Railroad Freight Rates Competitive with Barge and Truck

Historically, certain practices in the conduct of railroad freight rate regulation are here referred to because they establish the fact that the Interstate Commerce Commission's progression away from the strictly economic determination of rates has been a continuing and gradual process. Some of these practices, parenthetically, have already to a considerable degree passed out of existence.

Early the principle of "class rates" was established. Commodities transported were grouped into classes, roughly by value. Freight rates in the aggregate were established at a level which would yield a compensatory rate of return, but rates on the more valuable commodities were increased and on the less valuable commodities were reduced—leaving the aggregate revenue produced unchanged—in order to relate the freight paid by the shipper to the value of his product.

Next, in establishing rates on certain commodities, notably coal, where the commodity transported from one area would at the point of consumption compete with that transported from another area, great attention has been paid by the Commission to "maintaining commercial equality" at the point of consumption. Fuel quality of coal was even considered. This then could and did mean that the Commission increased the approved rate from one field above the computed rate determined by economic cost and depressed the approved rate from a competing field below the computed rate determined on the same basis. The Commission thus was engaging to some degree in indirectly but consciously regulating where the user should buy his fuel.

More recently, the Commission has deliberately adopted the policy of basing railroad

rates in certain cases where they compete with barge lines and truck operations more on an objective of influencing the relative flow of traffic between the three media than on railroad costs. Be it said, however, that the Commission has not been furtive, but rather brutally frank, in the cases where it has thus tended to tell the shipper how to conduct his traffic department. Follows, a revealing passage.

> "It is of great importance that each be afforded a fair opportunity to compete for this traffic . . . the proposed rates . . . would reverse the present situation and deprive the tank-truck operators of a fair opportunity to compete with the respondents (railroads)."

Or again—

> "Costs are not, however, the sole criterion. An important consideration is whether the proposed reduced rates are lower than necessary to meet the competition encountered."

I am not suggesting that the Interstate Commerce Commission sets all such "competitive" rates in accordance with the foregoing policy. On the other hand, the Commission's adherence to this policy is not infrequent.

The first quotation was from a Commission report dealing with rates on refined petroleum products from refineries in the Chicago, St. Louis, and Southern Illinois areas to consuming points. Although the Commission specifically found that "except for distances under 75 miles, the respondents (railroads) are the low cost agency on this traffic" it nevertheless fixed rates of which the following are a good example:

Origin	*Destination*
Whiting, Ind.	Forrest, Ill.
Wood River–Roxana, Ill.	Herrin, Ill.
Robinson, Ill.	Bloomington, Ill.

The ICC and the Transportation Act

Again in the case of competition with barges the movement of sugar north of New Orleans is a good example. Although similarly finding that "the evidence is convincing that the proposed rates would be compensatory" the Commission refused to allow the rates proposed by the railroads; and insisted on railroad rates equal to 10 per cent more than the total cost of the water-haul to the shipper (including loading and discharging costs if any). The Commission wound up its report with the almost macabre statement that "the slowness of barge transportation is often advantageous to the shippers where storage space may not be available"—in other words, the barges were to have a 10 per cent freight rate differential *and* the privilege of giving warehousing free.

Incidentally, not all of this must be laid at the door of the Interstate Commerce Commission. Congress, in the 1940 Transportation Act, indulged in some rather specious ambiguity in defining the "National Transportation Policy"—whatever that may be. In construing this legislation the Supreme Court in the early 1940's—when it was enjoying a period of relative orthodoxy for the post-depression era—said that the Commission was "to some extent the coordinator of the different modes of transportation."

In conclusion, therefore, there are a very sufficient number of decisions to support the statement that in fixing competitive railroad, barge line, and truck rates the Interstate Commerce Commission in many cases does not base the railroad rates on the economic cost of the rail service, but rather on a desire to control or influence which of these the shipper—assuming that a free enterprise competitive economy will lead him to select the cheapest—shall use.

Truck Rates	*Rail Distance*	*Minimum Rail Rates as Fixed by ICC*
13.5¢	91	14.5¢
12.5¢	104	13.5¢
17.7¢	151	18.5¢

Voluntary Oil Import Program—Pacific Coast, Canadian Oil Imports

Somewhere in the legislation affecting either tariffs or defense, or both, there is authority for the President to establish mandatory im-

port quotas for certain items following a finding by him that such procedure is required in the interest of national defense.

At the urging of some of the independent oil producing interests, a Cabinet Committee was appointed and finally recommended to the President (1) that the establishment of such quotas for liquid petroleum (principally crude oil) was (along the line of reasoning discussed below) required by national defense; (2) that it would be preferable to secure the reduction in petroleum imports by means of a "voluntary program" and thus (3) to avoid the establishment of fixed import quotas. Such a program was implemented by the Department of Interior on Presidential order and Capt. Carson (USN) was borrowed from the Navy to act as Administrator. Capt. Carson has held hearings and made findings on whether the quotas were adequate and fair and on certain other matters.

The appointment of a naval officer in this capacity follows precedent—the Navy traditionally, not only here but in England and Japan, being the Government's petroleum arm because, in the era between the *Dreadnought* and the *Nautilus,* fuel oil was sea power. On the other hand, the propriety of naming of any regular career officer (not retired) of the armed services, to a position which must fulfill some quasi-judicial functions in connection with a Government sponsored program, invites scrutiny.

Apparently the reasoning as to why a restriction of crude petroleum imports is necessary to the national defense, runs something as follows. The United States has somewhat less than a quarter of the free world's proven oil reserves and produces approximately one-half of the free world's oil. Its reserves are, therefore, being used up approximately twice as fast as the average. (The foregoing figures are for the Continental United States, not for North America.) Additional drilling is, therefore, necessary in the United States. So far so good.

All the interested parties, including the Government, skate conveniently around the fact that, lacking a drilling subsidy (or an indirect incentive in the form of increasing present favorable "depletion" allowances), the only way to promote drilling in the Continental United States is to increase the price of oil—or equivalently to prevent its falling when it would otherwise do so. The Cabinet Committee did, however, most strongly state that drilling would be increased if imports were reduced.

Parenthetically, a rather complicated side-eddy develops over the argument that the reduced imports will be replaced by marginal production which would otherwise be abandoned because of high cost. The writer probably over-simplifies this one aspect of the question, but he cannot see where this does any more than leave one exactly where one started in relation to reserves.

There are large imports of Canadian oil to the Pacific Coast area principally to Puget Sound, where some American refineries have been built for the sole purpose of processing Canadian crude. Initially, the Pacific Coast was exempted from the Voluntary Program and Pacific Coast Canadian imports were, therefore, largely undisturbed. Canadian imports into the northern part of the Middle West were, and continue to be, mainly undisturbed.

Impact on Canadian Oil

Following hearings conducted by Capt. Carson as Administrator, however, it was decided to include the Pacific Coast in the "Voluntary Import Limitation Program" and quotas there were established for Canada slightly below the present level of imports.

The reaction north of the border was remarkably restrained, but the Canadians made no secret of the fact that this cut off their principal hope of expanding production from Western Canada where new fields—not wells—are being brought in regularly. The so-called "Levy Report" by a petroleum geologist has been sponsored by fourteen leading independent Canadian oil companies (the three biggest oil companies in Canada are controlled respectively by Standard, Gulf, and Texaco)

and several other detailed plans have been put forward to implement these general findings. The net of these is that British Columbia and Alberta should not expect any increased petroleum shipments to the United States Pacific Coast in the immediate future and should reorient their thinking and their construction accordingly.

There is a very seriously sponsored proposal that an existing pipeline from Alberta now terminating at Toronto, which has relatively little potential increased capacity, should be extended to Montreal (now principally supplied by Venezuela crude). As a companion project, this existing pipeline would be rebuilt ("looped" is the technical term) and additional pumping stations installed so as to give it enough capacity to supply the whole Montreal market. Alternately, the existing line would not be improved in any major degree but a whole new pipeline would be built from Alberta to Montreal. These projects run up into the half-a-billion dollar level.

Current Canadian Developments

The so-called "Fort St. John area" is about 60 miles east of Seattle and some 500 miles or so north of the border. It is the source from which natural gas has recently been brought to the Puget Sound cities on both sides of the border. Recently drilling for gas in or near Fort St. John has brought in large quantities of oil which it was proposed to dispose of by the building of a pipeline westward some 350 miles to the seacoast. Silence regarding this project since the imposition of the Pacific Coast import quotas has been eloquent.

These changes in trunk pipelines are not the only changes possible. The objective of a major sector of the western Canadian oil situation may revolve from the West to the East. Specifically, future gathering lines from the wells to the main trunks might be oriented so as to carry the oil eastward and not westward. Up until recently, drilling activity has been higher in western Alberta and in British Columbia than further to the East because of a more favorable cost/discovery relationship. This may change, and the emphasis may be on drilling farther East where discoveries will have lower transportation costs to Montreal and where, incidentally, a less favorable discovery ratio will create less reserves for the same amount of drilling.

Significance for Defense

Not all of this is bad for national defense. Whereas in times of peace both the United States and Canada play at the game of national independence, whenever an emergency arises the inevitability of treating defense on a continental basis asserts itself.

From the point of view of continental defense, the Montreal line itself may prove to be an advantage. As against this, the abandonment of the Fort St. John-Pacific Coast line and of plans to fortify the existing lines from southern Alberta to Puget Sound, the failure further to develop gathering lines to take existing oil to Puget Sound and any moving of the center of drilling activity eastward (to areas of lower discovery rate) are all minuses to United States national defense.

Without exception when an American Company would protest some point of the Program, or fail voluntarily to conform to it, either the Secretary of the Interior or the Program Administrator—or sometimes both—have pointed out that the "Voluntary" Program's failure would be immediately followed by the institution of mandatory import quotas. Why the Government chooses thus to play at having a "Voluntary" Program is not indicated, but at least *The Wall Street Journal* has pointed out that the consequences of establishing a mandatory program and of having it appealed to the courts might produce considerable Governmental embarrassment in the light of existing anti-trust legislation. Whatever the explanation, however, it is no secret that the Program is only "Voluntary" so long as it is unnecessary to make it otherwise.

Since the unexpected Canadian switch to a "Conservative Party" government last fall,

it has been the vogue in Washington to be very careful regarding any American action which might prejudice Canadian interests. All of the Canadian implications of the imposition of Pacific Coast oil import quotas, therefore, more than likely have come as a surprise to the U. S. Government in general and to the Department of Interior and the Import Program Administrator in particular.

We, therefore, see that, in this instance, a United States Governmental Regulatory Agency is taking steps which (1) unwittingly alter in a major degree the economic development of Canada and (2) may even prejudice U. S. defense objectives as seriously as they advance them, possibly without even realizing that these effects inhered in the steps.

Atomic Energy Commission—Rental Valuation of Enriched Uranium

All of the nuclear power plants under construction or under contract in the United States, except one, use a derivative of uranium as fuel. The one exception uses thorium. Most of the uranium-consuming plants use a substance known as "enriched uranium." Natural uranium contains 0.7 per cent of U235 (the active component) the balance being U238. Enriched uranium can range all the way from 1.5 per cent U235 (for certain middle western power plants) to 90 per cent U235 for the submarine *Nautilus*.

The Atomic Energy Commission does not sell uranium but charges a rental therefor based upon a published scale of values for the product. The rental is also determined by a published formula including a percentage for use and a charge for depletion based upon the actual (not computed) amount of uranium consumed. The valuation scale is approximately as follows:

Product	*Percentage U235*	*Value Per Pound*
Natural	0.7 per cent	$ 20.00
Enriched	1.5 per cent	$ 40.00
Enriched	90 per cent	$40,000.00

Paranthetically, it should be remarked that "enriched uranium" is not an identical substance with that used by the presently operating—and many of the proposed future—nuclear power plants in Great Britain. Intense technical discussion, if not controversy, is currently taking place over the relative merits, both from a technological and an economic point of view, of the two different types of uranium derivative used here and in Great Britain. This fact is not germane to this discussion. Its existence is noted, however, lest the charge of omission be incurred.

The Atomic Energy Commission, by legislative enactment, is rigidly restricted in the information which it can publicize. No information is, therefore, publicly available as to its costs. The public in fact is not even aware whether it maintains cost records and, if so, of what nature.

For some time, however, certain facts have been publicly available which raise a grave question as to whether the Atomic Energy Commission is recovering any substantial part of the economic cost of producing the type of nuclear fuel being largely used in this country from rentals based upon the above values. Recently, moreover, a study by the University of Utah quoted in *The Wall Street Journal* of February 11th adds additional weight to these doubts.

Large Consumption of Electricity

There have been numerous printed references to the fact that so-called "gaseous diffusion process" plants of the AEC are consuming in the production of American type, uranium-derivative, nuclear fuel between 9 and 10 per cent of the total electric power output (thermal and hydro, private utility, and public authority, all combined) of the United States.

This is an astounding figure but it is only offered after multiple checks with informed sources. Specific inquiry was even made whether, in figuring the total from which the 9 to 10 per cent is derived, the output of such plants as Bonneville, Grand Coulee, and Boulder Dam are included. The writer was assured that they were. The "total" may not include production of industrially-owned power plants (such as steel mills, etc.) where the total

output is consumed within the plant limits. The existence of this figure is the first one that raised doubts as to whether the AEC was valuing uranium-derivative fuel for anything approaching its economic cost.

The Wall Street Journal's quotation of the University of Utah report somewhat broadens the foregoing statement to cover all AEC plants "that convert Uranium into fissionable products for peace and war." This modification drops one's amazement a notch or two, but still does not remove the basic question regarding the valuing of fissionable fuel.

The Wall Street Journal's article further makes two other factual statements which carry the consideration much farther economically, as follows:

1. One kilowatt hour of electricity input to produce fissionable fuel (American type) produces fuel sufficient to generate two kilowatt hours.
2. One pound of coal input to a thermal electric generating plant generates sufficient power to mine 145 pounds of coal.

One of the larger Illinois coal companies made available the figures for the year 1957 from one of its larger more efficient strip mines, as follows:

Power consumption 14,000,000 kilowatt hours.

Coal production approximately 1,500,000 tons.

Based upon the foregoing and on assumed consumption of three-quarters of a pound of coal per kilowatt hour produced in the power plant, one arrives at the fact that one kilowatt hour input into the mine produces fuel sufficient to generate 142.7 kilowatt hours output of the power plant.

It must be noted that this is a different but parallel figure to that in *The Wall Street Journal's* quotation (presumably of the Utah report). *The Wall Street Journal's* figures are based on coal input and output, and the second group on power input and output.

This produces the amazing conclusion that as a matter of thermo-dynamic economics, the production of uranium fuel with electricity, in order to reemploy the fuel in generating electricity, is one-*seventieth* as efficient as the same process substituting coal for uranium.

The writer would carefully refrain from jumping to the conclusion that this proves that the AEC is currently undervaluing uranium fuel based on economic cost; and is, of course, aware that even if he did so plunge he could not carry any thinking reader with him. The foregoing facts, however, taken together do raise a very large question on this subject which is of vital importance because of the implications of an assertion that uranium fuel is being undervalued.

The Significance of Costs

If and to the extent the AEC is radically undervaluing atomic fuel, it is completely distorting all of the considerations on which civilian atomic power developments are being predicated. Marine developments, Navy, and civilian, are an entirely different question. Militarily, freedom from refueling, high power output with light weight (including fuel), compactness (also including fuel) far outweigh considerations of cost. Even in the Merchant Marine some of these facts could have a beneficial economic effect which could even make cost a secondary consideration—the improvement could be only less radical than that offered by the transition from sail to steam, where the displacing innovation was much more costly.

In the power production field, however, whether the producer be a private utility with head offices at No. 1 Wall Street, or a farmer's cooperative in Open Spaces, Idaho; whether one approaches the matter from a point of view of commercial cost to the consumer or on the broadest plane of conservation of natural reserves, one must come in the end to economic considerations.

Lest the propriety of including this subject in a discussion of Regulation be questioned, it is noted that the value-determining function performed by the AEC here is identical with the rate-determining function performed by

the technical staff of the Federal Power Commission when it fixes the cost of power for interstate transmission. If the AEC errs here the resultant public damage vastly exceeds that which would result from error on the part of the Federal Power Commission in fixing the interstate power rates. Relatively little of the power generation of the country is involved in such interstate transmissions. Most of the output of nuclear power plants, and most of the expenditure of money, brains, and research going into them, is affected by the AEC's valuation of fissionable fuel.

Here then is the third case of "hidden regulation," where a governmental body exercising (or failing to exercise) a cost or value determining function may be drastically distorting the physical economics of a basic national industry. The gravity of the situation is heightened by the fact that, the suspicion having been raised, not only can no one determine whether it is well- or ill-founded, but no one can even determine whether the governmental body itself realizes that the pitfall lies across its path.

Conclusion: A Reason?

Shakespeare, speaking through Macbeth, has said, ". . . it is a tale told by an idiot, full of sound and fury, signifying nothing."

As mentioned at the outset, this discussion has presented three progressive instances where Regulation in a given field was extending into areas not ordinarily expected. Is there then anything more to the tale than "sound and fury"? Does it signify only "nothing"? Or perhaps, is there some underlying common force that generates—or, if they be generated by hazard, accelerates—these phenomena?

Most of us have been part of, or have had contact with, some governmental body. Although Regulatory Commissions, Government Departments, Program Administrators develop certain internal guidances, mechanisms, and inertias of their own, these are more often in the direction of unreasonable adherence to previous courses than of sudden deviations—the impetus for any of the latter more often comes from the outside.

A conclusion is no place to begin a second study. No attempt is, therefore, made to give any reason whatsoever for the suggestion that if this discusison has any point, it is that study should be given to the "pressure elements" operating upon Government Regulation and Regulators.

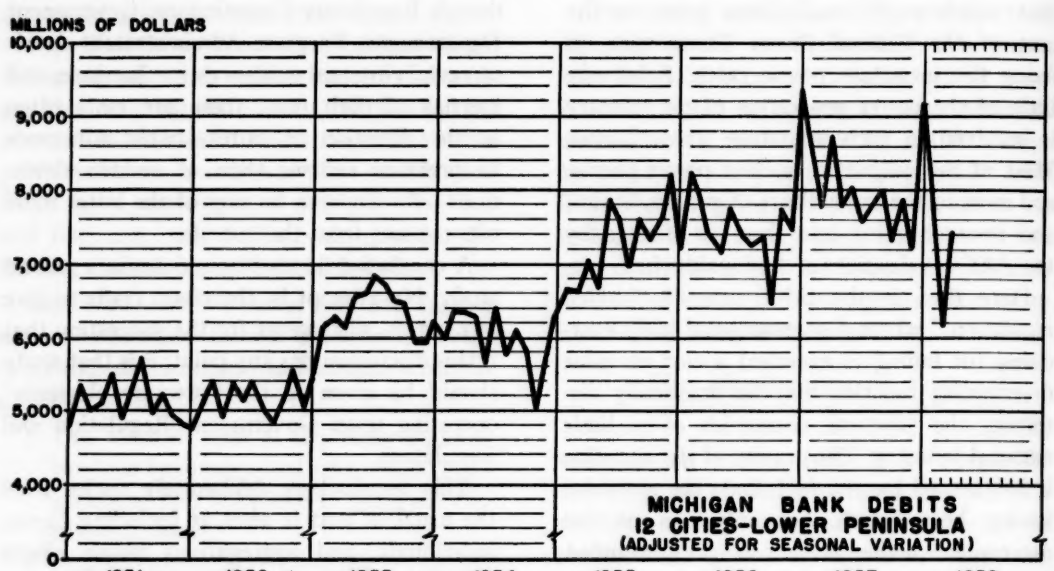
This terminology deliberately varies from the usual in that it aims at including forces, individuals, and aggregations whose effects parallel the effects of "pressure groups," but which would not necessarily be classified as such. The writer seeks a more inclusive term which includes the "pressure groups" as they are usually defined, together with other elements of a related nature. If these pressure elements, their anatomy, their operations and their effects be studied, an important common ancestor to the various "hidden regulation" phenomena may be unearthed. The regulators may after all have been pressured into action in relation to which the "public interest" is but a magic cloak of invisibility hiding the "special interest" which is the true beneficiary of the particular act of regulation.

BIRTH AND TAXES

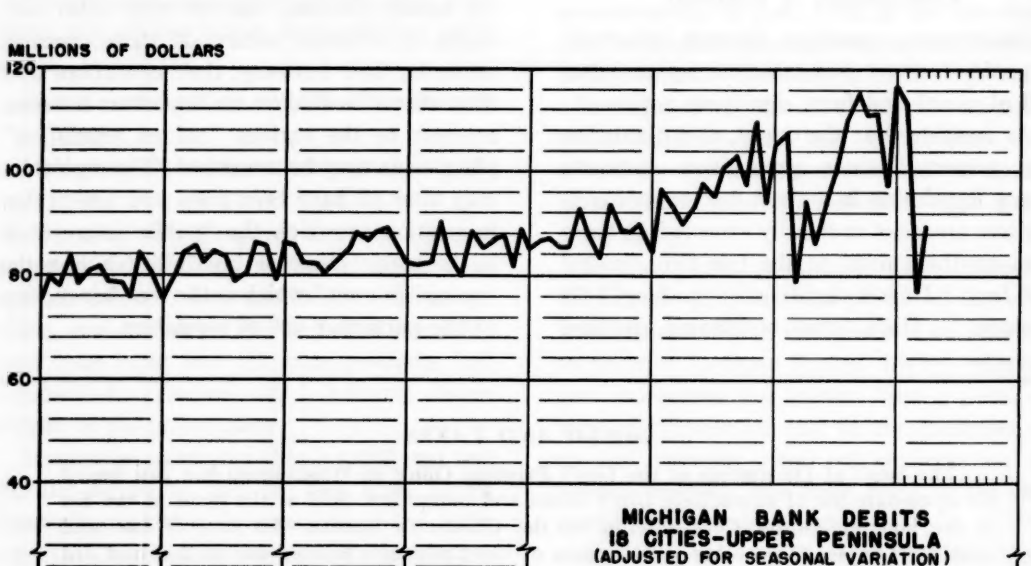
The Sup't of Documents of the Gov't Printing Office in Washington has just issued an up-to-date list of best-selling Gov't books and pamphlets. Still at the head of the list is the booklet, *Infant Care,* offered by the Children's Bureau. To date it has sold 10,823,652 copies. Two other publications of the Children's Bureau are in 2nd and 3rd place—they are *Prenatal Care* and *Your Child from One to Six,* respectively. In 4th place is a manual, *Your Federal Income Tax.*

—*Quote,* March 23, 1958, p. 7

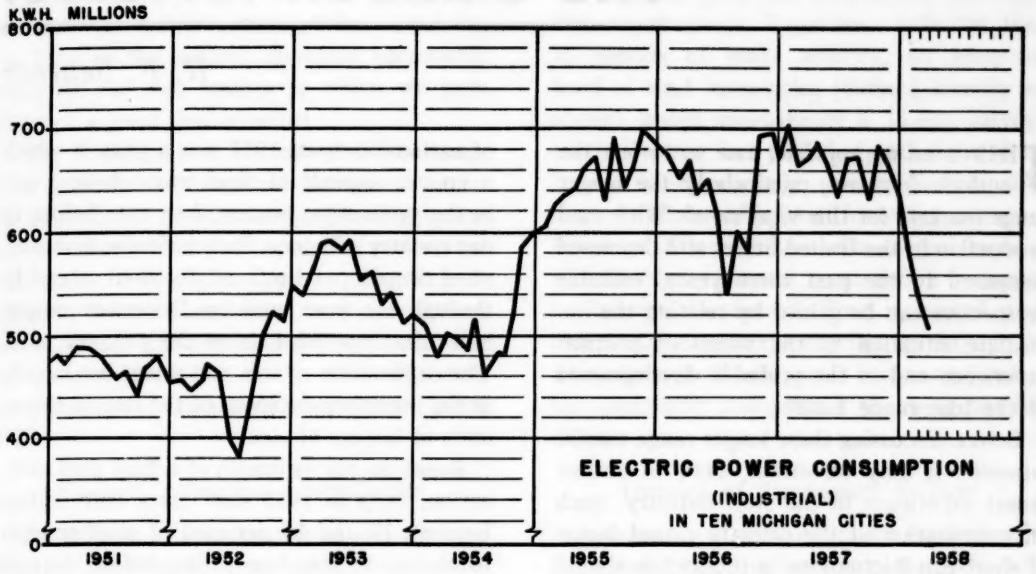
Michigan Business Indicators



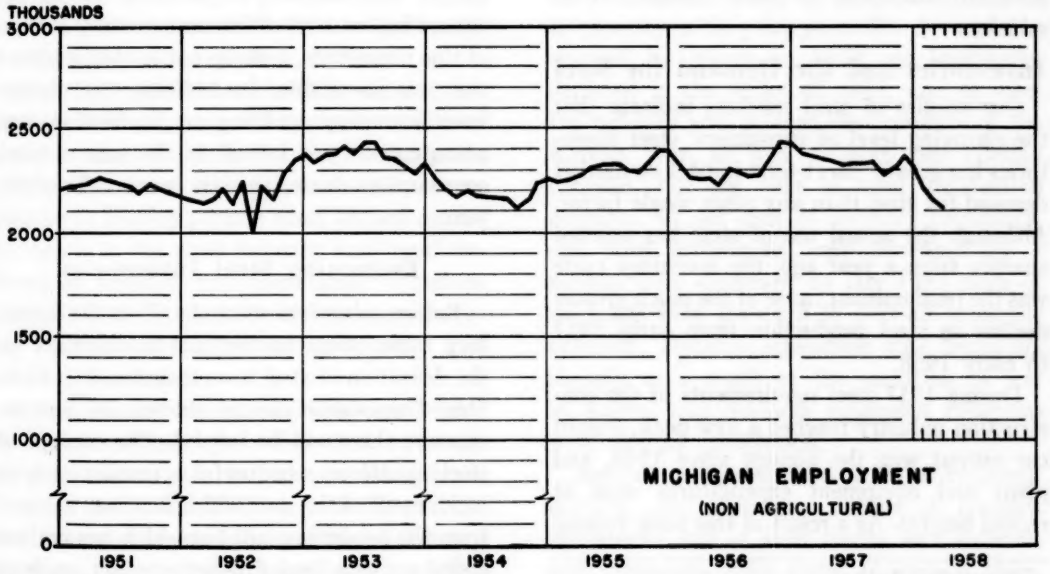
BANK DEBITS–THE MOST ALL INCLUSIVE MEASURE OF BUSINESS ACTIVITY–Lower Peninsula bank debits continued to decline during the month of February, then showed a substantial gain in March.



UPPER PENINSULA BANK DEBITS–Upper Peninsula bank debits continued to fall sharply in February, but began to rise again in March.



POWER CONSUMPTION—Industrial Power Consumption continued to fall off sharply during both months of February and March.



MICHIGAN EMPLOYMENT—Total employment continued to decline both in February and in March.

• *An authoritative analysis of trends in production, utilization, and inventories in a basic industry.*

The Outlook for Steel

R. F. Sentner

THIS is an appropriate time to review the outlook for steel, particularly the longer range markets for this vital metal. With steel production in the United States still depressed compared to the past three years, valuable perspective can be gained by relating the immediate situation to the sweep of postwar experience and to the probable developments of the long-range future.

Before discussing these longer range trends, however, it may be useful, first, to outline recent experience in the steel industry. Such an examination of the primary causal forces of short-run fluctuations in production should provide a clearer understanding of fluctuating market conditions in steel and of the more stable rate of actual steel usage. It may also, through shedding additional light on a complex problem, contribute in some measure to its solution.

Inventories and the Demand for Steel

Our studies of steel markets indicate that the changing level of consumers' steel inventories has greater short-term impact on market demand for steel than any other single factor. Although the actual use of steel has receded sharply from a year ago, the inventory cycle was the predominant cause of the much greater decline in steel production from early 1957 to early 1958.

During 1957 steel requirements of the construction industry reached a new peak, freight car output was the highest since 1948, and plant and equipment expenditures were at record heights. As a result of this peak volume of national output, 1957 was a year in which a greater amount of steel was "chewed up" in the production process than ever before in our country's history. Paradoxically, however, steel ingot production declined steadily through the year, and by December output had fallen one-third below the January total. The explanation of this movement lies largely in the inventory decisions of the tens of thousands of buyers of steel.

Based on our estimates of actual steel utilization, early in 1957 steel users were adding between 10 and 15 per cent of steel receipts to stocks. It was late spring before over-all accumulation of inventories ended. The reversal in customer inventory policy from building to reduction continued throughout 1957, and the equivalent of 6 million ingot tons of steel was cut out of stock during the second half of 1957. With an inventory change of this magnitude, a sharp cut in steel production was inevitable. In addition, the change from inventory building to liquidation was accentuated by a fall-off in the rate of steel consumption during the last few months of the year.

Estimating Steel Inventories

Before going into more detail on the inventory cycle, some background information on the definition of steel inventories used in U. S. Steel Corporation market studies and how we measure them will be helpful. The concept of steel inventories most useful in market analysis includes all of the steel which has been shipped from the producing mill but which has not yet ended up in a final finished product, such as an automobile, refrigerator, bridge, or tin can. Thus, in addition to inventories of raw steel,

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this definition includes steel in the form of material in transit, work in process, component parts, warehouse stocks, and other material not yet assembled into finished end products.

Unfortunately, there are no ready-made statistics on such inventories. What knowledge we have on the subject, therefore, necessarily rests on our own studies to which we have devoted a great deal of effort.

The first step is to estimate steel consumption on the basis of the level of physical output in each of the various steel consuming industries. A comparison of consumption with actual shipments of steel plus imports makes it possible to isolate the change in stocks. When consumption exceeds shipments, inventories are being reduced. Conversely, when shipments are in excess of consumption, stocks are being built.

Factors Affecting Inventories

In addition to a knowledge of the absolute level of steel inventories, metal stocks must be evaluated in terms of anticipated steel needs. When economic activity declines, a lower quantity of steel is sufficient for the reduced production requirements. When the economy is operating at peak, a larger supply of steel will be necessary to meet output needs for the same period of time.

The degree of steel availability and the psychological effect of over-all business conditions and financial considerations also affect significantly customers' views of the proper inventory level. During periods when unused capacity exists in the steel industry and rapid delivery is possible, consumers tend to reduce costs by shifting part of the inventory-carrying burden back to the steel producers; and stocks are reduced.

In contrast, when general business begins to improve, customers order steel not only for production needs, but also to fill up their depleted stockpiles. This surge in demand for steel customarily results in lengthened delivery promises, thus further contributing to the "tightness" of steel supply. For a given user of steel, a higher level of inventories becomes a practical necessity if sales opportunities are to be protected.

Consequently, our conception of what constitutes a "normal" supply of steel varies with the business cycle and with actual consumption requirements. Experience indicates that in periods of lower activity, an adequate level of steel inventories (defined broadly as above) would approximate a 75-day supply, on the average. In a period of peak demand, at least a 90-day supply of steel is probably desired. Historically, steel inventory accumulation or reduction has been carried beyond this 75–90-day normal range before a change in direction is effected. That is, *actual* steel inventories are always moving up through or down through this "normal" inventory band—but eventually going too high up or too far down.

Impact of Inventory Swings

A summary of steel inventory experience in 1953 and 1954, the last complete cycle, will provide additional perspective on the impact of inventory swings.

The steel industry entered 1953 with production facilities operating at 100 per cent, even though 9 million tons had been added to capacity in the prior year. The demand was spurred by efforts to build up inventories depleted in the strike of 1952, and to meet the military and defense requirements of the Korean War, as well as high-level civilian demand. For the year in total, production averaged 95 per cent of industry capability, and steel inventories were increased by 3 million tons. However, by late 1953 signs of weakness were apparent in over-all economic activity. Defense spending was dropping sharply as a result of the cessation of war in Korea, and business expansion programs were nearing completion.

Against this downward drift in economic activity, the top-heavy nature of business inventories and of steel stocks was obvious; and customers were eager to reduce them. Consequently, more than 7 million tons of finished steel came out of stocks during 1954.

Consumption also dropped—approximately 10 per cent—but steel *shipments* were sliced by over 20 per cent. Thus, more than *half* of the decline in steel output in 1954 was attributable to inventory liquidation. Again, in the recovery in output in 1955, the change in inventory movement from reduction to accumulation accounted for over half of the increase in production to 117 million ingot tons.

The Current Inventory Cycle

Our experience in the current inventory cycle has been similar to the timing in 1953–54. Steel production increased sharply after the 34-day steel strike in 1956. The renewed plant and equipment boom was still on the ascendancy, and steel usage was climbing to new peaks. Stocks had been depleted during the strike, and the inevitable rush to secure needed steel, not only for increased production, but also to build up inventories, pressed against steel industry production capacity.

Some buyers were unable to obtain the sizes and grades of steel they wanted at the time they wanted it. Thus, although steel capacity was more than adequate to service *consumption* requirements in 1956 and early 1957, the *supplementary* demand for inventory purposes created spot scarcities in some steel products such as plates and structural shapes, inducing still greater demand for inventory protection.

As a result, it is estimated that in the eight months following the strike, total steel stocks grew by 40 per cent, and in early 1957 steel users were adding between 10 and 15 per cent of steel receipts to stocks.

By late spring, it became apparent that the accumulation of inventories had been carried too far, and in May and June a gradual shift in direction began to take place. The reversal in business inventory policy from building to reduction in one steel product after another continued through the remainder of 1957, resulting in steady reductions in steel production. During the latter months of 1957, steel shipments were approximately 10 per cent below actual usage of steel, and four and one-half million tons of finished steel were cut out of inventory. Net reduction for the year in total was one and one-half million tons. As a direct result, steel production declined in 1957 to 112.7 million ingot tons, despite the greatest amount of consumption in our industry's history. Inventory cutting continued at an accelerated pace in the first quarter of 1958.

Comparison with Utilization

It is obvious that this pattern of excessive inventory swings is costly to the steel industry and to its customers. Orders fall off sharply in periods of inventory contraction with resulting curtailed steel production. On the upswing excessive inventory building means utilization of less efficient standby facilities, more overtime, more expensive production. For the customer, inadequate inventories can lead to production delays, while excessive inventories tie up working capital and cut into profit margins. It is apparent that the steel producers, their employees, and customers would profit from greater stability in inventory levels.

Certainly, swings in steel production would still take place, but their magnitude would be greatly reduced with inventory movements smoothed out. The changes in steel usage underlying these short-run fluctuations have been far less pronounced than a look at the production rate would imply. The following table illustrates the difference between the rate of steel production and estimated utilization of steel in finished products such as cars, appliances, and buildings.

Year	*Index of Steel Ingot Production*[1] *1947–49=100*	*Index of Steel Ingot Utilization*[2] *1947–49=100*
1947	101	97
1948	106	102
1949	93	102
1950	116	108
1951	126	116
1952	111	118
1953	133	131
1954	105	118
1955	140	134
1956	137	132
1957	135	138

[1] American Iron and Steel Institute.
[2] United States Steel Corporation Commercial Department.

The difference between the two series reflects changes in steel inventories—either inventory building when the usage rate is lower than production or inventory reduction when the usage ratio is higher.

The Situation in 1958

The continuing liquidation in steel inventories begun about a year ago has given a distorted picture of the severity of the decline in demand for steel in 1958 also. However, the accelerated depletion of stocks since the first of the year carries with it the promise of improving steel output in future months. Thus, the mere slowing or cessation of inventory reduction will result in a modest pickup in production. Moreover, it is important to understand that steel taken out of inventory will eventually have to be replaced, when stocks have been drawn down below normal requirements as they are at present. Consequently, the severity of the decline in steel production relative to actual use makes a higher level of operations by the end of 1958 the most likely expectation.

However, expectations of an improvement in steel production arise not only from a belief in the inevitable upswing in the inventory cycle, but, still more, from a conviction that tremendous future market opportunities are awaiting the steel industry. It is our appraisal of the underlying growth in steel demand that gives me confidence in the outlook for steel, both short and longer range.

It is possible to write with still greater assurance on the long-term outlook for steel. Opinion is virtually unanimous that our economy will grow in the coming decade—only the magnitude of the growth is in question. And, there is little question, too, that steel will continue to be as important to the economy of the future as it has been since the Industrial Revolution began.

The Long-Range Markets for Steel

At United States Steel much effort is devoted to appraising and analyzing these long-range markets for steel. The keystone of a thorough approach involves the integration of all the commercial experience and knowledge available. The facts of each product and each geographical area are analyzed in order to provide the tools for future planning.

We live in a dynamic economy which demands that planning and forecasting be done on a continuing basis and that we move forward from year to year, adjusting our sights to the new horizons which are revealed before us. Thus the completion of one forecast is just the starting point for the next one. During the entire postwar period, we have followed a policy of continuing review and extension of long-range market and sales forecasts in order to have at all times a realistic basis for facilities and commercial planning.

The validity of these future market estimates depends on the fundamental upward trend in our basic economy and in the nation's need for steel. During the postwar period, a succession of new market forecasts has gradually lifted our concept of the future from the conservative philosophy engendered by the prewar depression to one of long-term optimism.

This change in thinking has been generally true for all of industry and in steel is evidenced by the steady additions to productive capability that have occurred since 1946—approximately 50 million tons. However, recent operations of the steel industry well below our rated capacity have led observers to ask once again whether excess capacity exists in steel.

New Times, New Opportunities

The real danger is not that we may have expanded too far, but that we may not rise to the market opportunities and responsibilities which lie before us. Looking beyond the short-range factors now depressing steel industry operations, the future is as bright as ever. The first post World War II decade has shown that the present American economy differs fundamentally from the between-the-wars model. Its essential stability has been greatly increased, and a growth factor has been built in. These significant changes are

the result of many factors: social and economic legislation, growth and dissemination of knowledge about how the economy works, and the intelligent appraisal and use of this knowledge by both management and labor. The adoption of long-range planning by business and the great historical expansion of scientific research and development of new processes and products give additional promise of greater stability.

Thus, I do *not* believe the postwar experience has been a fluke—that economic advances must inevitably lead to collapse. Our national economic growth will continue, limited only by the potentials of our labor force, our gains in productivity and our wisdom in employing our economic resources. There will be corrections or recessions similar to those in 1949, 1954, or our current experience—because such minor fluctuations are the price of a free market system—but the more tragic features of the thirties will not be repeated. The construction industry, machinery production, automotive output, and other consumer goods production will fluctuate from year to year—as they have—but it is very unlikely that they will all move in phase, and they will individually exhibit a trend of long-term growth. That much used phrase, "the rolling readjustment" has become an economic fact.

Growth in the Next Ten Years

Within this general economic framework, our studies indicate that by the late sixties, the nation will be turning out on a normal, annual basis more than 8 million passenger cars. Total construction activity will have increased by 25–30 per cent. In an effort to provide increased productivity and a rising standard of living for 200 million Americans, research and development expenditures will have contributed to a 35 per cent gain in machinery output. Appliance production will have grown by nearly 50 per cent.

Moreover, all of these projected gains are in terms of "normal" production. In a peak year in the late sixties, demand might require 20–25 per cent greater output for any of these basic steel markets than indicated above.

Because our basic markets for steel are growing and growing rapidly, and because it is essential that the steel industry have sufficient flexibility to satisfy demand in a year of peak activity, we believe that from 30 to 40 million tons of ingot production capability will have to be added in the next ten years. This new capacity is essential not only to our peacetime economy, but even more vital, it is essential to our national security.

INFORMATION FOR SMALL BUSINESSES

A complete 287 page presentation of the information provided at the recent President's Conference on Small Business Research is available at $2.50 from the Commerce Department's Michigan Office, 438 Federal Building, Detroit 26, or from the Superintendent of Documents, Washington, D.C. Ask for PB131460.

It includes many answers on how smaller businessmen can obtain and use the benefits of today's wealth of technical and marketing information to improve their products and increase sales and profits.

Case histories illustrate the value obtained by the use of this type of assistance in small varied manufacturing, wholesaling, retailing and service operations.

• *Current business conditions focus management attention on securing efficiency in distribution.*

Eleven Approaches to the Problem of Distribution Costs

Donald R. G. Cowan

ONCE again, business managements are turning their attention to distribution costs. Distribution costs include all the outlays for effort required in the process of bringing to consumers and industrial users the products of factories, farms, forests, and mines. They cover many vital services such as buying, selling, transportation, storage, risk-taking, financing, market information, and market management—at manufacturing, wholesaling, and retail levels.

For many products, the expenditures involved in their distribution exceed those required in production, and account for more than half of the price paid. Since these expenditures are usually made by many independent — and often competing — managements, they are frequently more complex, more subject to uncertainty as to their effectiveness, and more difficult to control than production costs.

Business interest in this subject always rises when declines in sales volume are in prospect or in progress. The period of the 1930's was the heyday of distribution cost analysis, while during World War II when production rather than distribution was the all-engrossing problem, attention was given it by a mere handful of companies mainly because of misgivings about their postwar sales volume and their desire to find the most effective channels and methods of distributing old and new product lines.

This lack of concern continued through the prosperous postwar period except for the brief hesitancy in business in 1949 and 1954 when again a few companies gave temporary attention to the costs involved in their distributive systems, especially when they were obviously out of line with those of their competitors. In addition, a small number have felt it necessary to examine their distribution costs for the special purpose of defending their pricing policies. The recent business decline has revived interest in distribution costs.

A Growing Problem

There are several reasons why many business executives are as yet not fully aware that distribution costs are an increasingly serious problem.

Consumers have been willing to pay prices which cover all costs and yield satisfactory profit margins. Radically new labor-saving devices in production and expanding volume have helped to keep costs and selling prices from rising as much as wages. Very frequently the successive wage increases obtained by plant employees during the past decade were automatically given to distributive employees on a blanket basis without much regard to

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the efficiencies of the individual receiving them. It was taken for granted that the higher level of distributive expenses would be offset by the expanded physical and inflated dollar volume. The result has been that marketing and selling expense ratios to dollar sales volume have not seemed out of line, and comparatively little attention has been given to the cost and effectiveness of all sorts of distributive practices.

But the situation is changing rapidly. Marketing and selling expense ratios have been rising in many companies. Volume has declined in some industries, and there is the widespread necessity to meet competition by expanding and training the marketing staff as well as by stepping up expenditures for advertising, promotion, delivery, and technical services to buyers.

Efficiency of Distribution Costs the Test

Management, of course, does not expect to eliminate distribution costs. In fact, it would not be surprising if expenditures for distribution services tend to rise, in view of the widening markets for many products which are not prime necessities of life. Millions of consumers, in using their increasing purchasing power, are free to choose not only between different brands of the same product but also between entirely different products and services—between a new house, car, washing machine, television set, insurance policy, stocks, bonds, or a bank savings account.

Management would be derelict in its duty if, in the competitive race, it did not strive to maintain and expand the market for its product or product line. Hence, its problem is not the complete elimination of distribution costs but rather the elimination of inefficiencies. The test questions are what expenditures are effective enough to bring a profitable return for the effort, and how different efforts may be made more effective. In other words, it is a matter of the ratio of efficiency to expense.

No magic formula exists for meeting this problem. Management must tackle many phases of distribution cost and efficiency with various tools and remedies at its command. The first step is a many-sided diagnosis, similar to the use of an analyzer in finding out what is making your automobile engine inefficient and costly to operate. Having found the difficulties, management can apply the proper tools and methods to bring improvement. Distribution's complexity necessitates a many-sided diagnosis, and a variety of remedies involving resourceful management. Hence, there are many approaches to distribution efficiency and its accomplishment. A number of these may be outlined briefly.

I. The Product Approach

Since how much can be sold for a given expenditure of time and effort is one important measure of efficiency, it is of prime importance to see that the right product is being offered for sale. People buy, primarily, on the *merits* of competing products, and the easiest and most profitable product to sell is the one which most nearly satisfies the requirements of its particular market. A food may be made of the finest ingredients, clothing may contain the best yarn and workmanship, a washing machine may have the most durable parts, a watch may contain ever so many expensive jewels, and an electric stove or car may have many extra gadgets—nevertheless, they must meet the taste, pattern, style, price range, and other requirements of a selected segment of the market in order to be sold profitably.

To better satisfy demand, new products are continually being invented, and existing products improved. We have forgotten the makers of bicycles, automobiles, soap, furniture, and ham who have passed into limbo because they thought that consumer tastes stood still; conversely, the growth and profits of many existing companies have resulted from their keeping up with changing product preferences.

To do this, not only is physical research necessary, but also marketing research is very desirable in determining the product characteristics which people like and dislike in competing products. Moreover, buyers' reactions to both new and improved products may be

determined by consumer product tests. In one of many such experiments, the tests showed that improvements were necessary in the color, texture, and flavor of food; these improvements not only reduced the product's raw material costs, but also caused rapid increases in the sales of the new product, reduced selling expenses proportionately, and increased profits.

Sometimes the preference of wholesalers and retailers from the standpoint of product gross margin, volume, and handling costs may also be very important.

Product improvements, geared to market requirements, increase the effectiveness of all kinds of selling, advertising, and other kinds of distribution expense.

II. The Product-Line Approach

The distribution of a product-line rather than of a single product will frequently reduce marketing costs—when certain conditions are met. Briefly, products suitable for a line should be sold in the same market, and should be distributed through the same channels without involving very different methods and problems. Food stores, for example, handle very wide lines of goods for the convenience of all consumers, but wholesalers tend to restrict their lines to products having common requirements in wholesaling. The meat line requires refrigeration, and the vegetable line needs fast transportation.

One frequent mistake is to assume that products made by the same plant department may be sold by the same salesman. For example, a company manufacturing and marketing a line of metal office furniture and lockers found that it could also make kitchen cabinets with the same materials and machines. Its salesmen could not sell kitchen cabinets through office furniture houses, however, and had to take time to call on other types of retail outlets, thereby causing office furniture sales to decline. In the end, a separate sales force had to be established.

Even when the products in the lines are distributed together, there is a limit to the number of products in the line set by the limited time and ability of the salesmen to sell them all and the tendency of some buyers to purchase individual products from different suppliers. Within limits, however, widening the line of products with common standards of quality and uniform branding tends to economize in selling, advertising and other distribution expenses.

III. The Channels Approach

Many alternative marketing channels are available, and the choice made will greatly affect distribution costs and efficiency. Many conditions govern the choice of channels such as the marketing of a single product or a related product group, the volume of output, the size and breadth of the market, the practices of competitors, the relative advantages and disadvantages of using manufacturers' agents, brokers, wholesale merchants, owned sales offices and warehouses, retail outlets of different types, a partially or completely integrated system, direct selling to industrial users compared with warehouse selling, direct selling from plant by salesmen or mail order catalogs, and the like. Moreover, as a firm's output grows, it is necessary to reconsider what channels may provide more efficient distribution and to revamp the structure of price discounts.

IV. The Engineering Approach

Distribution involves many physical activities in the moving and storing of goods so they will be available in proper quantities where and when wanted by the ultimate buyers. This involves both transportation and space utilization between and within various establishments.

There are many opportunities for studying the use of various kinds of handling equipment, the arrangement of physical layout, and the systematizing of many activities through time and motion analysis, sometimes leading to a sufficient degree and standardization to make possible the use of automatic or semi-automatic machines in place of labor.

Several reasons for the rapid expansion of motor truck transportation have been the savings in handling and deterioration of goods,

time involved, and flexibility of movement for medium length hauls. One firm, for example, is studying the possibility of obtaining convenient return loads from others so as to give it more control of the transportation to and from its plants and warehouses on an economical basis.

Time and motion studies have been applied to salesmen's activities with startling results to show how much time is devoted to travel, selling, order and report writing, and miscellaneous duties.

V. The Operations Research Approach

The operations research approach, which is very new and closely allied to engineering, offers many possibilities.

It offers opportunities for the comparison of alternatives in minimizing effort in accomplishing a given end. For example, it may help in choosing the location of a warehouse, a jobbing center, a sales office, or a salesmen's headquarters which will minimize the physical operations of salesmen and deliveries of goods. It may be extended to the choice of store locations which will maximize consumer convenience in shopping.

Many selling organizations have kept records of salesmen's calls on customers. When they consider how territories may be revamped to increase the number of calls and call-time and to reduce time devoted to travel, waiting, and miscellaneous activities, they are, in effect, applying operations research to a phase of distribution costs, and usually with very beneficial effects through increasing salesmen's selling time and hence his productivity at little or no additional cost.

VI. The Accounting Approach

The accounting approach is more familiar to sales executives, but it has not been exploited fully in distribution. Typically, it involves the classification of a firm's distribution expenses, volume, and earnings, by salesmen's territories, by general line and specialty salesmen, by departments and products, by activities performed, and the like. The resulting comparisons of expenses, volume, and earnings have been helpful in indicating which classified segments of distribution have been more or less profitable.

Some firms have profit and loss statements for branch houses, many individual salesmen, product departments, and sales departments, and ask each responsible person to operate each unit as profitably as possible.

All of these applications of accounting are beneficial and it is regrettable that some sales executives try to get along without them or make insufficient use of them in budgeting and planning their selling operations. Very frequently, the accounting records are partly to blame because they combine profitable and unprofitable situations together, thereby failing to spotlight them for attention.

Many records of expenditures, volume, and earnings need to be extended so as to relate them to the actual physical operations of distribution. For instance, most sales executives need to know more than total expenditures in each sales territory. They want the cost per call and the total cost of the salesmen's calls, time spent on each customer and prospect, the cost of telephoning different customers including payments for telephone service and the employee's time in doing so, the cost per delivery and the total cost of making deliveries to each customer and the cost of correspondence, bookkeeping and special services for each customer.

Sometimes the special selling services cost more than regular selling. For example, the practice of assigning engineers and chemists to industrial customers for short or long periods of time is very costly and is no less a selling expense because these men may be on a plant payroll.

The analysis and comparison of costs and the development of standard costs as guides are insufficient in themselves. They must be compared with volume and earnings in order to determine whether or not they are justified.

For many purposes in controlled selling it is very helpful to divide costs into fixed and variable categories, according to different degrees

of variability. For example, over reasonably short periods, salesmen's calls and truck deliveries are to be viewed as direct costs which may vary in number by area, by size, and type of customer, and by product. If the earnings are not sufficient to cover even the direct costs of these efforts at the wholesale or retail level, there is nothing contributed towards offsetting the overhead costs of sales supervision, sales office, warehouse, and general expense, or towards paying dividends, although in some instances the volume may be desirable in keeping a plant in operation, compared with the cost of shutting it down.

From the longer range viewpoint of general management, many distribution costs such as those for branches, sales offices, and the like which seem fixed at a given time, are variable; and, after study of adequate records of expenses and earnings, may be changed to bring about higher net profits. There is, indeed, a great opportunity for the accountant to help in making distribution more efficient and profitable.

VII. The Economic Approach

The economic approach takes up where accounting leaves off. It is concerned with changing marketing conditions, sales forecasting, sales potentials by markets, areas and customers, buying habits, competition, pricing, and the application of selling, advertising, and other kinds of effort under conditions of diminishing returns to the point of marginal balance between expenditure and income and further to the point of maximum total profit or minimum loss.

In all these fields, the tools of analysis most frequently used by the marketing economist in making measurements useful to management in improving distribution efficiency are statistical facts and methods. For example, the expansion of public and private debt has been a powerful influence in expanding the buying of most kinds of both capital goods and consumers' durable goods. The economist may examine the effect of debt expansion on a company's sales and analyze the outlook.

The economic analyst may aid in measuring area and company potentials and in allocating different kinds of selling and advertising effort to these potentials with a view to maximizing profit. He may analyze the income and expenditures of different consuming classes and aid in determining prices and price spreads on products of differing quality so as to maximize sales volume and profits. Further, he may give advice on the appropriateness of borrowing funds and long-range investment commitments for distribution facilities of all kinds under various conditions.

Shifts in the population, industry, the rise of supermarket retailing, the integration of various stages in the marketing channels both vertically and horizontally, foreign trade and monetary conditions, and many other economic phenomena fall within the purview of the marketing economist, and provide a vast opportunity for him to be helpful in improving distribution efficiency.

VIII. The Personnel Approach

The personnel approach to distribution efficiency is somewhat different from those already described. In the long run, the ability of its distributive employees is a powerful influence in determining the firm's growth and competitive standing. Many aspects of distribution, especially the customer selling function, cannot be reduced to the impersonal and uniform activities of a machine. Hence, the selection, training, and compensation of distributive personnel, and the fitting of the employee to the task are very important long-run factors influencing distribution costs, yet the opportunities for improvement are far from exhausted in a multitude of companies.

In training, for instance, much time is devoted to familiarizing salesmen with the characteristics and advantages of products compared with those of competitors. This is necessary, but so also is the generally neglected field of training the salesman to do a more effective job by organizing his activities and using the most productive selling methods.

Has the salesman been told how to increase

his selling time and reduce his travel and waiting time; how much a call costs and how large an order must be to cover the direct expenses of obtaining and handling it; how to find out what a customer needs; when to let the prospect talk instead of himself; how to prolong the call so as to have time to sell the whole line; when to show a sample so it will increase the order and not reduce it as frequently happens; and what appeals to use in given circumstances?

Such training requires careful, competent study of the effective and ineffective methods used by a company's own salesmen and competitors in the same field, and no general book on selling techniques will meet the peculiar needs of the particular selling task.

Selection, compensation, and training of distribution people are very important current problems not only because new recruits are being added to the organization, but also because a majority of distributive employees have never had a test of selling in a real buyer's market.

IX. The Organizational Approach

The organizational approach is much wider than that of personnel. In order to bring about a hard-hitting organization, there must be clear perception and definition of the tasks to be performed at each level of management, both line and staff. Smooth-working relationships and communication between these tasks must be worked out; authority commensurate with responsibility must be delegated; procedures and inducements for stimulating maximum effort must be applied, and regular evaluations of performance must be made at all levels in order to eliminate ineffective personnel or unprofitable activities.

Since marketing conditions are continually changing the organization must be flexible enough to allow tasks to be eliminated or added as distribution needs change. Otherwise, what was once a hard-hitting organization soon becomes petrified and ineffectual. Effective organization is a prime requisite in accomplishing efficient distribution.

X. The Standardization Approach

Distribution comprises a multitude of activities in which the human element looms large and in which, therefore, there is much variation in performance. The difficulties of bringing about standardization in these human activities are at bottom the reason for lack of machine mechanization in many phases of distribution, especially in buying and selling. Nevertheless, there are important opportunities for increasing efficiency through standardization.

It has been pointed out already that employee tasks may be carefully defined as a step towards organization efficiency and that the effective methods to use in face-to-face selling may be determined which through training of salesmen may be applied more uniformly with very beneficial results. Through product testing and marketing surveys the effective product selling appeals may be determined and more uniform use of them may be brought about. Brands are the symbols of certain standardized product characteristics. A few motives dominate the buyer's choice of brands. If these are determined, the salesmen's appeals may be standardized. To the extent that such standardization can be accomplished, advertising of various kinds may be used to convey a standardized selling message which may accomplish economies not possible in personal selling, thus making more advertising a step towards more economical distribution to the mass market. Hence, within limits, standardization of various activities may be an important contribution to economical distribution.

XI. The Management Approach

The management approach includes and employs all the other approaches just outlined, but there is always something more, a priceless ingredient, which makes its contribution distinctive. It is not alone management's comprehension of all the different avenues by which distribution may be made more efficient and less costly, but also its open-minded, imaginative, and rational approach to the use

of new methods under conditions of continual change in distribution.

It must consider which alternative combinations of machines, personal effort, advertising, channels, products, and the like, will yield the largest distributive return in the future. Sometimes, for example, more advertising expense and less personal selling expense will increase volume and at the same time reduce expenses.

It must use the previously outlined approaches and methods in analyzing the results of its past plans and programs in order to decide what to continue to do in the future.

But it must also go beyond the analysis of past experience in deciding upon future ventures. This does not mean that it should gamble in the ordinary sense. Rather, progressive management uses test-tube experiments in distribution. The following example shows the usefulness of conducting an experiment. A large firm, well-known everywhere, more than twenty years ago, developed a line of hard-frozen branded meat cuts which were to be distributed along with fresh meats and which were well adapted to modern retail self-serve selling. This firm spent large amounts of money in providing hard-freezing equipment in its own wholesale units and launched the entire venture in distribution on a wide scale. The venture was an unexpected failure because it had overlooked the then total absence of hard-freezing display cases in retail shops, the consumer prejudice, now past, against anything frozen, the necessity of educational advertising to explain the charging of what seemed to be a higher price for a trimmed meat cut of branded quality as compared with an untrimmed and unbranded fresh meat cut, and above all, the opposition of the powerful union of retail meat cutters. Some surveys of conditions and opinions of retailers, or an experiment in distribution on a very limited scale simulating the conditions to be encountered on a national scale would have saved millions of dollars for investment in the project at some future time when market conditions were more favorable.

More recently, another large firm, well-known everywhere, developed a line of insecticides which obviously could not be distributed through its regular channels. It decided to set up distribution through grocery stores, and developed a national distribution for doing so. It failed. Besides studies of where people buy insecticides, and what women buy in grocery stores, a limited experiment under conditions simulating those to be encountered nationally, might have helped to avoid a costly mistake in distribution.

The management approach to accomplishing new distribution efficiency includes a willingness to venture on new paths with risks minimized by a maximum of knowledge gained not only by the analysis of past experience, but also by scientifically conducted experiments showing how improved distribution may be successfully attained. Open-minded, imaginative, and rationally venturesome management is indeed a priceless ingredient in accomplishing efficient, profitable distribution.

In summary, the current need of attention to distribution efficiency has been emphasized. Eleven different approaches to the problem have been outlined, namely, the product, the product-line, the channels, engineering, operations research, accounting, economic analysis, personnel, organization, standardization, and management. There are others, too, if time permitted. Nevertheless, these approaches constitute a challenge to marketing executives to tackle a vast and relatively unexplored opportunity for reducing distribution costs by increasing distribution efficiency.

• *Essential for modern industry is the bonded diamond grinding wheel.*

Industrial Diamonds— a Strategic Material

C. B. Slawson

WE are all conditioned in our thinking of *gem* diamonds as feminine decorations that cost $1,000 to $1,500 per carat. It is difficult for the mind to hurdle the gap to *industrial* diamonds that cost $2.80 per carat. That is the import price charged in London by Industrial Distributors (Sales), Ltd., (the so-called "Syndicate") for the 8,000,000 carats of the lowest quality of industrial diamonds that we annually import. And again, millions of carats confuse the mind. We do not normally think in those units. Eight million carats is somewhat less than two tons.

A Vital Strategic Material

To leap from jewelry, a luxury, to a vital strategic material is a feat of mental gymnastics; and diamond is both. Not only is diamond a strategic material, but the report of the President's Materials Policy Commission, commonly called the Paley Report,[1] placed it along with four other materials in a category of Special Strategic Materials. This category includes those strategic materials that cannot be produced within the United States at any price. This report preceded the development of man-made diamonds by General Electric.

Because diamond is the only one of these five strategic materials not found in appreciable quantities in the Western Hemisphere, the Malone Subcommittee[2] of the United States Senate Committee on Interior and Insular Affairs in 1954 placed industrial diamond in a category by itself next to uranium and other fissionable material in the Subcommittee's report on strategic materials. This report of the Subcommittee made in the summer of 1954, however, did not receive wide circulation or final acceptance.

The strategic importance of industrial diamond is revealed in the expansion in its use during World War II. This is shown in Figure 1, where the imports and in Figure 2, where

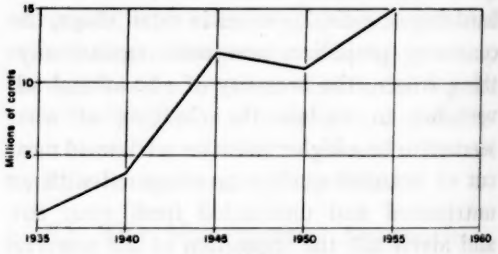

FIGURE 1
U.S. imports of industrial diamonds, by weight, five-year intervals, 1935–1955.

[1] Vol. 2, Chapter 19, p. 92, June 1952.

[2] Minerals, Materials, and Fuels Economic Subcommittee pursuant to Senate Resolution 143 of July 28, 1953, directing "full and complete investigation and study of the accessibility of critical raw materials to the United States in time of war."

About the Author—

During World War II, Professor Slawson was Chairman of the Advisory Committee on Industrial Diamonds and Supervisor of Research for the War Metallurgy Committee of the National Research Council. In 1956–57, as Chairman of the National Academy of Sciences-National Research Council Panel, he wrote the classified report on the synthetic diamonds produced by the General Electric Company. He has made four extended trips to the diamond mines of Africa, and one to the Brazilian mines. He is co-author of the standard reference text on gem diamonds. He is a graduate of and Professor of Mineralogy in this University.

the value of the imports are graphed for five-year intervals from 1935 to 1955. This rapid rise reflects a technological change, accelerated by the demands of the wartime economy.

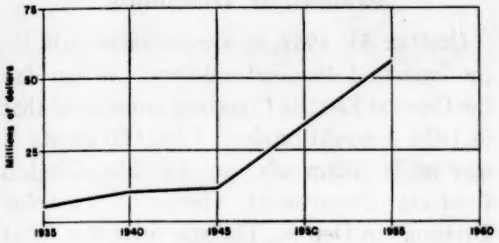

FIGURE 2

U.S. imports of industrial diamonds, by value, five-year intervals, 1935–1955.

For Harder Abrasive Grinding Wheels

The development of harder and much more effective tungsten carbide tools in the late 1930's, which replaced high-speed tool steel and tungsten steels, required a harder and more efficient abrasive grinding wheel for sharpening them. Tungsten carbide as a tool material is best known under the trade name of Carboloy. It was too hard to be effectively shaped and sharpened by silicon carbide (carborundum) and alumina grinding wheels. The bonded diamond grinding wheel was developed in 1939 to sharpen these carbide metal cutting tools.

Mass production and automation require close tolerances in manufactured parts, measured in terms of ten-thousandths of an inch. Moreover, cutting tools must be sharpened, and grinding wheels must be trued to even closer tolerances than those allowable in the products they are to produce. As research develops harder and tougher tool materials to remove excess metal, a still harder material must be used to sharpen and true these new tool materials. The ultimate tool in this chain is diamond—the hardest known substance. And scientific theory teaches that we shall never be able to make a substance harder than carbon crystallized as the natural mineral diamond.

Pre-War Production and Prices

In Figure 3 the average price per carat of imports of industrial diamonds is plotted over the same period as is shown in Figures 1 and 2. The drop in the average per carat price as we entered World War II represents (1) the increased use of the lowest grade of industrial diamond, "Crushing Bort," so named because it was crushed to a grit to be incorporated into grinding wheels; and (2) the wartime pricing policy of the British.

Diamond mining is a joint product industry. All mines produce all grades of diamonds from

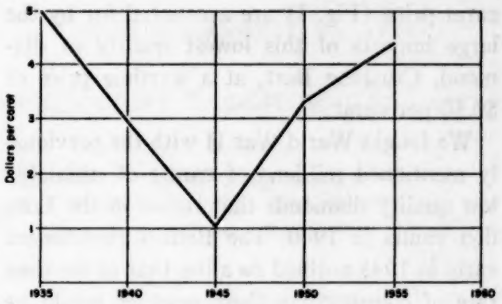

FIGURE 3

Average price per carat of U.S. imports of industrial diamonds, five-year intervals, 1935–1955.

the finest gems down to Crushing Bort. The relative percentages of the various grades vary markedly from mine to mine. The exceedingly rich (from the standpoint of total weight produced) Bakwanga, Congo mines, yielded only 4 per cent gem quality stones. Chiefly because of this Bakwanga production, large quantities of the lowest grades of diamonds accumulated in London for which there was no market, prior to 1940, at 4 shillings ($.80)[3] per carat. These were the hoards of diamonds that gave rise to the rumors that gem diamonds would be as cheap as glass if it were not for the Syndicate policy of withholding them from the market. Actually these millions of carats in the London vaults were yellow-brown opaque stones and no jeweler would ever suspect them of being diamonds.

[3] Before devaluation from $4.00 to $2.80 per English pound.

War-Time Supplies

With the invasion of the Low Countries and the fall of France, industrial diamonds were declared strategic material in the United States by Executive Order on June 27, 1940, and on July 17, 1941, they were placed under priority allocation control. Concomitantly, by a sort of reverse lend-lease arrangement, the British established, for the duration of hostilities, fixed lower prices of industrial diamonds imported into the United States. Crushing Bort was reduced from 4 shillings ($0.80) to 2½ shillings ($0.50)[3] per carat. The great increase in imports (Fig. 1) and the drop in the average per carat price (Fig. 3) are accounted for by the large imports of this lowest quality of diamond, Crushing Bort, at a wartime price of $0.50 per carat.

We fought World War II with the previously mentioned millions of carats of unsalable low quality diamonds that rested in the London vaults in 1940. The British government early in 1945 notified its allies that at the then rate of consumption these reserves would be exhausted late in 1946. The war ended before plans to expand the Congo production and reopen the Premier Mine in the Transvaal were completed.

Figure 1 does not accurately reflect the industrial situation in the post-war years, because part of the annual importation went into the government stockpiles of strategic materials. Because all details of the stockpiling program are classified as secret, it is impossible to ascertain what part of the 15-fold increase over a twenty-year period is attributable to industry's demand for industrial diamond. It is generally assumed that approximately 2,000,000 carats were added annually to the stockpile. The London price in October 1957 for volume purchases was 20 shillings ($2.80)[4] per carat for Crushing Bort; the open market price in New York was at that time $4.25–$4.50 per carat.

Man-Made Diamonds

October 33, 1957, is a memorable date for the industrial diamond industry. On that day the General Electric Company announced that in 1958 it would produce 3,500,000 carats of man-made diamonds at its Metallurgical Products Department (formerly Carboloy Division) in Detroit. The sale price was set at $4.25. The product is competitive now only with the lowest grade of industrial diamond, Crushing Bort, that which is crushed to form grit for the manufacture of bonded diamond grinding wheels for the shaping and sharpening of carbide tools. This is the important strategic use of diamond.

By the end of 1957 some sales of natural diamond Crushing Bort were made in the open New York market at a price of $2.68 per carat, a drop of nearly 40 per cent in a thirteen-week period. Only the foolhardy would attempt to extrapolate Figures 1, 2, and 3 to the year of 1960. The paramount consideration is that in the year of Sputnik the United States became independent of a foreign source of supply of a Strategic Material. Diamond is still a Strategic Material; it is no longer a *Special* Strategic Material.

THE KEY DATA

Year	*Imports Carats*	*Value of Imports*	*Average Price Per Carat*
1935	1,000,000	$ 5,000,000	$5.00
1940	3,800,000	11,000,000	2.90
1945	12,000,000	12,750,000	1.06
1950	11,000,000	36,750,000	3.30
1955	15,000,000	66,000,000	4.40

[4] After devaluation to $2.80 from $4.00 per English pound.

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INTRODUCTORY SESSION JUNE 23—JULY 19; INSTITUTE JULY 21—AUGUST 16, 1958

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